

# (12) UK Patent Application (19) GB (11) 2 254 689 (13) A

(43) Date of A publication 14.10.1992

(21) Application No 9207643.9

(22) Date of filing 08.04.1992

(30) Priority data

(31) 9107427

(32) 09.04.1991

(33) GB

(71) Applicant

Blue Circle Domestic Appliances Limited

(Incorporated in the United Kingdom)

Myson House, Railway Terrace, Rugby,  
Warwickshire, CV21 3JH, United Kingdom

(72) Inventor

Eric David Herbert

(74) Agent and/or Address for Service

Brian R Lawrence

59 Shenfield Place, Shenfield, Brentwood,  
Essex, CM15 9AH, United Kingdom

(51) INT CL<sup>5</sup>

F23D 14/14

(52) UK CL (Edition K)

F4T TGM TGO T234

U1S S1975

(56) Documents cited

None

(58) Field of search

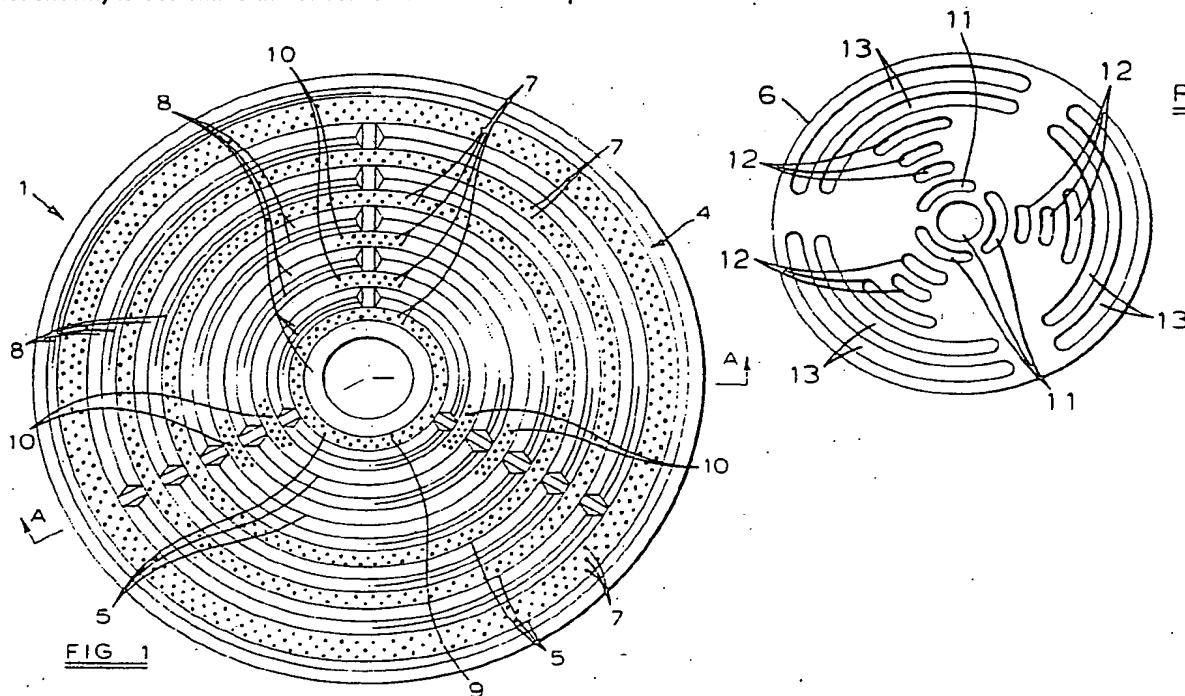
UK CL (Edition K) F4T TGM TGO

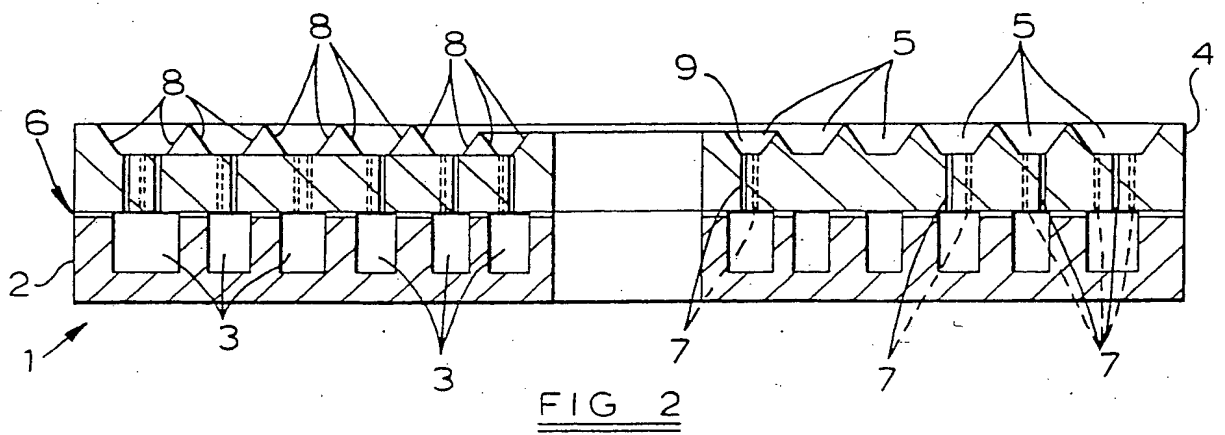
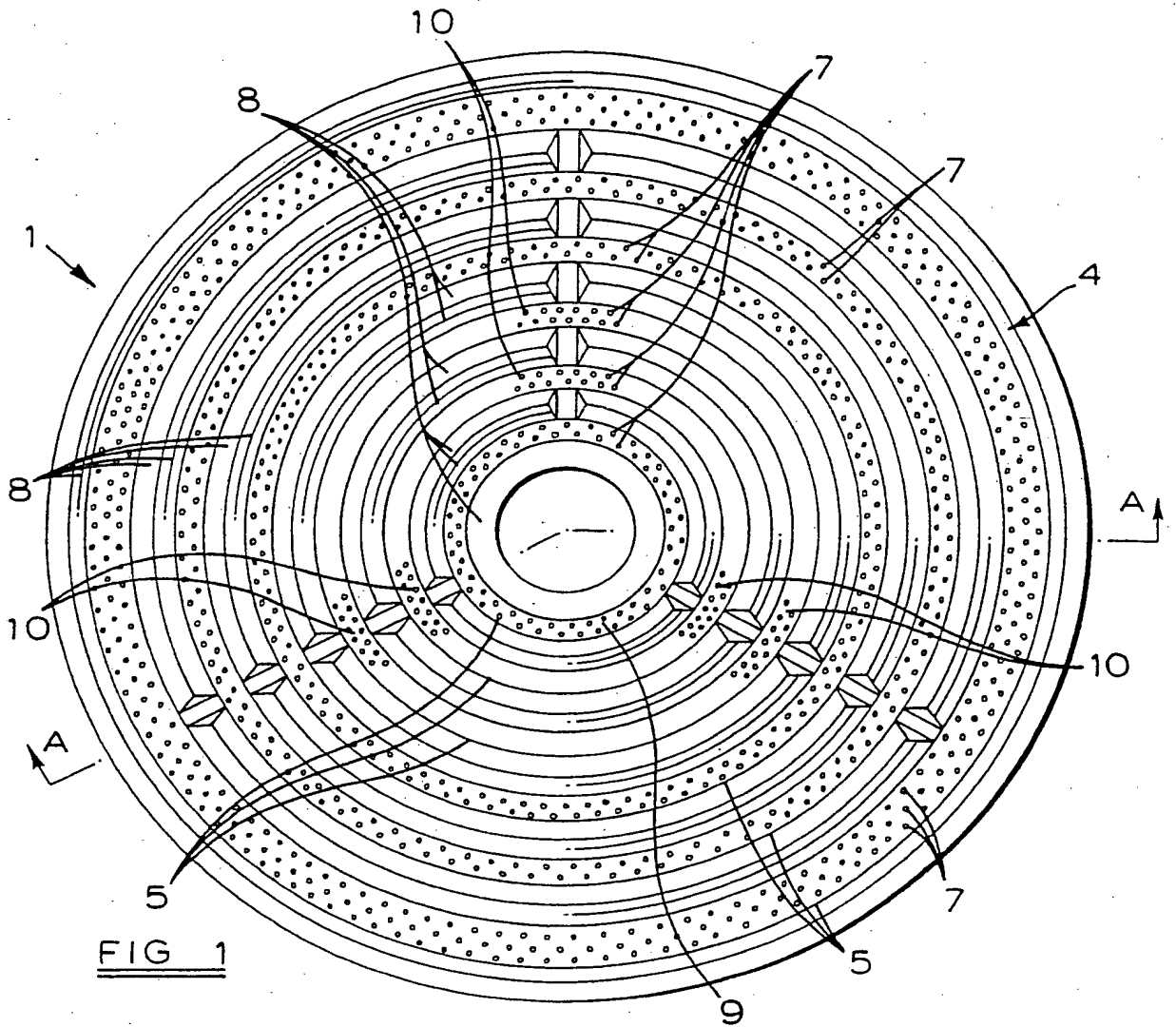
INT CL<sup>5</sup> F23D

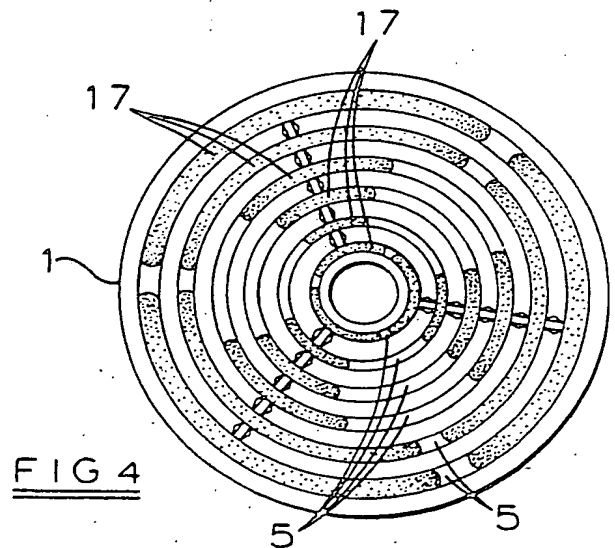
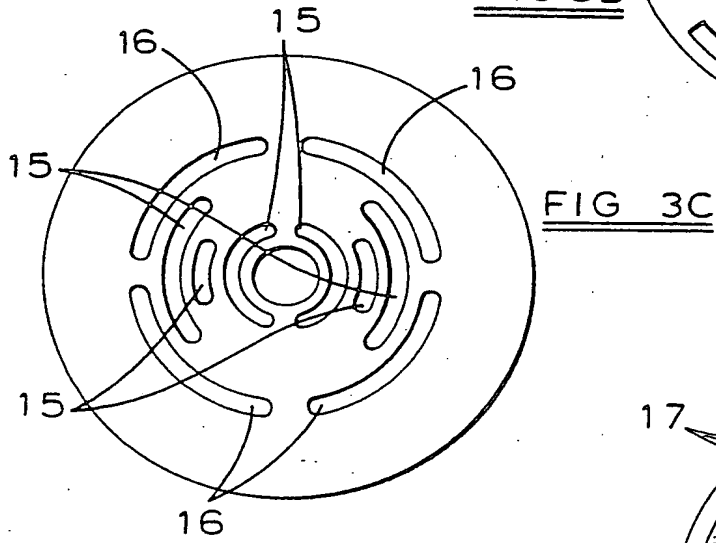
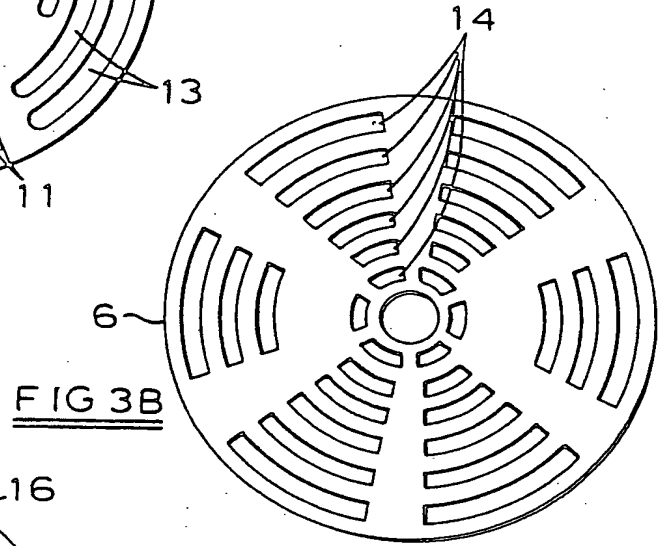
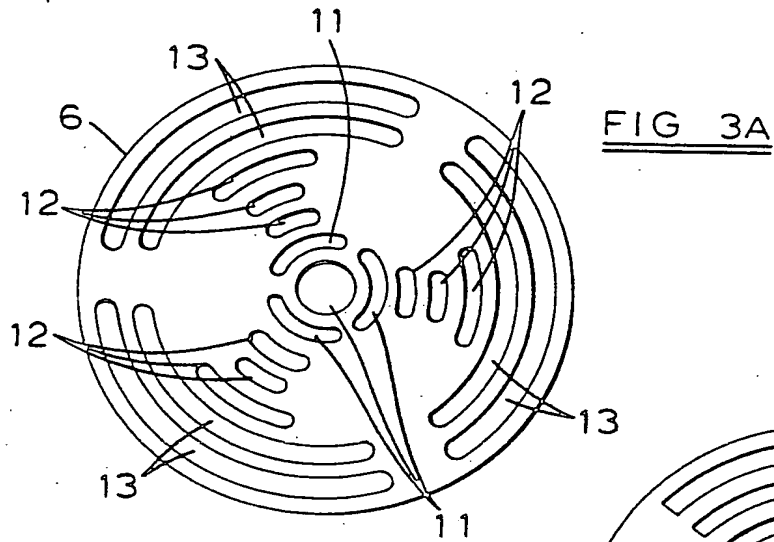
Online database: WPI

## (54) Adjustable gas burner for a cooker

(57) A radiant gas burner 1, especially for a glass topped hob, comprises a plurality of concentric channels 5 which are individually provided with a gas/air mixture via flame ports 7, one or more of the channels 5 being provided with a reduced number of flame ports 7 in groups 10 whereby the heat output may be increased by a small amount as may be required to effect simmering as additional channels are successively brought into use. A gasket (6) with concentric slots 11, 12, 13 of different lengths is disposed between the ports 7 and corresponding concentric fuel/air mixture supply passages (3) (Fig 2, not shown) to determine the effective number of flame ports in each channel.







1.

Gas Burners

This invention relates to gas burners, and is especially applicable to gas burners for use in a gas hob having a flat, ceramic glass top with one or more  
5 gas burners spaced slightly below it.

In International Patent Publication No. WO90/12255 there is disclosed a gas hob which incorporates a plurality of gas burners which consist of a number of concentrically disposed chambers in a base plate  
5 thereof, to which chambers a gas/air mixture is fed, respective open tops of the chambers being closed by a ceramic plaque having a series of flame ports set around concentric passages, which correspond to the chambers below them. The gas/air mixture thus passes  
15 from the chambers upwardly into the respective passages and burns at the flame ports of each passage, thereby causing the surface of the ceramic plaque adjacent to each passage to be heated. The plaque is thus heated to a high temperature, and radiates heat through the  
20 upper glass top of the hob to any food container stood thereon. With such a gas burner, the supply of gas/air mixture to each of the chambers is controlled such that each of the concentric passages can be energised, normally starting with the inner passage. The  
25 disposition of the flame ports in each of the concentric passages is such that the heat output of each passage is substantially proportional to its diameter with the result that, as each of the passages is energised starting from the inner passage, the heat  
30 output increases substantially linearly. However, the situation can arise where, in order to achieve a simmer condition, for example, only a small increase in heat output is required, and this is impossible to achieve in the gas burners which have been proposed.

It is an object of the invention to provide an improved gas burner which seeks to alleviate this problem.

According to the present invention there is  
5 provided a gas burner comprising a plurality of concentric gas supply chambers in a lower part thereof, a corresponding plurality of concentric passages in an upper part thereof, a plurality of flame ports extending through said upper part from each of said  
10 chambers to a corresponding one of said passages, the flame ports of at least some of said passages being arranged such that, in use, the heat output from the respective passages varies in a non-linear manner.

In one arrangement for carrying out the invention  
15 it may be arranged that the flame ports of at least one of said passages are spaced continuously around said passage, and the flame ports of at least one other of said passages are arranged in spaced groups around said passage.

In another arrangement for carrying out the invention it may be arranged that the flame ports in at least some of said passages are spaced continuously around the respective passage, and means is provided associated with at least one of said passages for  
20 blocking some of the flame ports thereof, whereby in use only spaced groups of said flame ports around said passage are operational.

It may be arranged that a gasket is provided between said lower part and said upper part of said  
30 burner, the means associated with at least one of said passages for blocking some of the flame ports thereof being constituted by said gasket.

It may be arranged that in a gas burner as aforesaid inner and outer concentric passages may be  
35 provided each, in use, having operational flame ports

spaced continuously around the respective passage, and one or more intermediate concentric passages may be provided each, in use, having spaced groups of operational flame ports disposed around said passage or passages.

Some exemplary embodiments of the invention will now be described reference being made to the accompanying drawings, in which:

Fig. 1 is a top view of a gas burner in accordance with the present invention;

Fig. 2 is a cross-section view on the line A-A of Fig. 1;

Figs. 3A to 3C inclusive show different gasket shapes for use in a gas burner in accordance with the present invention; and

Fig. 4 is a diagrammatic top view of a gas burner in accordance with the present invention incorporating the gasket of Fig. 3A.

In Figs. 1 and 2 of the drawings there is shown a gas burner in accordance with the present invention which is of the type disclosed in International Publication No. W090/12255.

The gas burner 1 shown comprises a base part 2 in which is formed six concentric chambers 3 which, in use, are individually supplied with a gas/air mixture via suitable gas valves (not shown). On top of the base part 2 is positioned a ceramic plaque 4, the upper surface of which is provided with six concentric annular passages 5 which overlie corresponding ones of the chambers 3. A gasket 6 is provided between the base part 2 and the underside of the ceramic plaque 4 to prevent leakage of the gas/air mixture from the chambers 3. Each of the annular passages 5 is provided in the lower part thereof with a plurality of flame ports 7 which extend through the ceramic plaque 4 from

the chambers 3 to the concentric annular passages 5 and which allow the gas/air mixture in the chambers 3 to flow into the passages 5 to be ignited therein by suitable ignition means (not shown). Ignition of the gas/air mixture in the annular passages 5 will cause the adjacent walls 8 of the passages 5 to be heated by the combusting gas/air mixture.

The gas burner which has so far been described is of generally known form except that in known gas burners, the flame ports 7 extend continuously around each of the annular passages 5. In such a gas burner, the heat output from the annular passages 5 is substantially proportional to the diameter of the passage and as the passages 5 are successively supplied with a gas/air mixture from their respective chambers 3, starting from the innermost passage 9, the heat output from the burner 1 increases in a substantially linear manner. However, as has already been explained, in order to achieve a simmer condition of a cooking pan positioned on the gas burner, small adjustments of the heat output are required, and this is not possible in known forms of the gas burner 1 which has been described.

In order to achieve the small increase in heat output in the gas burner 1 shown in Figs. 1 and 2 of the drawings, the second and third innermost passages 5, instead of being provided with flame ports 7 which extend all around their respective passages 5, are each provided with only three groups 10 of flame ports 7, the major portions of the passages 5 being without flame ports 7. In this way, the heat output from the gas burner 1, when the second and third innermost passages 5 are turned on, increases by a small amount, in a non-linear fashion. The actual levels of heat output afforded by the second and third innermost

passages 5 may be set to any desired level by selecting the number of flame ports 7 in each of the groups 10, and also by selecting the number of groups 10.

5        Whilst the gas burner 1 which has been described with reference to Figs. 1 and 2 operates satisfactorily, once a particular configuration of flame ports 7 has been designed, it is not possible thereafter to change the design to any significant extent.

10        This can be overcome by arranging that each of the passages 5 is provided with a full complement of flame ports 7, i.e. the flame ports 7 extend completely around all the passageways 5, and by arranging that in some or all of the passages 5, some of the flame ports  
15        7 are blocked off so that the gas/air mixture only passes through those flame ports 7 which are not blocked.

20        The means for blocking the flame ports 7 in the passages 5 may take any convenient form but in the preferred embodiment is accomplished by suitably shaping the gasket 6 which is sandwiched between the ceramic plaque 4 and the base part 2. In this way any of the flame ports 7 in any of the passageways 5 may be blocked off, and different gaskets 6 may be provided to  
25        provide different heat output configurations, dependent upon any particular requirement.

30        Figs. 3A to 3C of the drawings depict typical gaskets 6 having blocking-off characteristics which afford to the gas burner different heat output characteristics. In Fig. 3A the openings in the gasket 6 corresponding to the innermost passage 5 of the burner 1 are formed into three approximately equal  
35        part-annular slots 11. The gasket openings matching the second, third and fourth innermost passages 5 of the burner are again formed as three equal part-annular



slots 12, but the slots 12 are short and widely spaced around the passages 5, so that the amount of gas/air mixture supplied to the second, third and fourth passages 5 is significantly reduced. The slots 12 are aligned radially to form three equi-angularly spaced 'spokes'. The annular gasket openings 13 matching the two outermost passages 5 are, like the opening for the innermost passage 5, only slightly interrupted.

Fig. 3B depicts a different gasket 6, in which, except for the openings for the second and third passages 5, each opening is divided into six equal slots 14, each set of six slots 14 for the six passages 5 being radially aligned. The second and third passage openings have only four slots 14, thereby providing the non-linear variation required to achieve simmering.

Fig. 3 depicts another different gasket 6, in which the openings corresponding to the first, second and third passages 5 each have two opposed slots 15, the second passage having the smallest slots 15. The opening corresponding to the fourth passage 5 has four slots 16 providing a nearly continuous annulus, whilst no openings are provided for a fifth or sixth passage 5. The burner 1 using this gasket would thus be low rated, effectively having only four passages 5.

Fig. 4 shows diagrammatically the flame arrangement of a burner 1 incorporating a gasket 6 generally of the form shown in Fig. 3A, the dark areas indicating glowing of the combusting gas/air mixture, when all of the passages 5 are in use.

The gaskets 6 can be made of any suitable material, such as ceramic fibre paper, silicone rubber sheet or could be steel sheet coated on both sides with silicone rubber.

CLAIMS

1. A gas burner comprising a plurality of concentric supply chambers in a lower part thereof, a corresponding plurality of concentric passages in an upper part thereof, a plurality of flame ports extending through said upper part from each of said chambers to a corresponding one of said passages, the flame ports of at least some of said passages being arranged such that, in use, the heat output from the respective passages varies in a non-linear manner.

2. A gas burner as claimed in claim 1, in which the flame ports of at least one of said passages are spaced continuously around said passage, and in which the flame ports of at least one other of said passages are arranged in spaced groups around said passage.

3. A gas burner as claimed in claim 1, in which the flame ports in at least some of said passages are spaced continuously around the respective passage, and in which means is provided associated with at least one of said passages for blocking some of the flame ports thereof, whereby, in use, only spaced groups of said flame ports around said passage are operational.

4. A gas burner as claimed in claim 3, comprising a gasket between said lower part and said upper part of said burner, the means associated with at least one of said passages for blocking some of the flame ports thereof is constituted by said gasket.

5. A gas burner as claimed in any preceding claim, comprising inner and outer concentric passages each, in use, having operational flame ports spaced continuously around the respective passage, and further comprising one or more intermediate concentric passages each, in use, having spaced groups of operational flame ports disposed around said passage or passages.

8.

6. A gas burner substantially as hereinbefore described with reference to the accompanying drawings.

-9-

**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number  
 9207643.9

**Relevant Technical fields**

(i) UK CI (Edition K ) F4T (TGM; TGO)  
 (ii) Int CL (Edition 5 ) F23D

Search Examiner

M J DAVEY

**Databases (see over)**

(i) UK Patent Office  
 (ii) ONLINE DATABASE: WPI

Date of Search  
 25 JUNE 1992

Documents considered relevant following a search in respect of claims

1 TO 6

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
	NONE	

Category	Identity of document and relevant passages	Relevant to claim(s)

#### Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

